

SEQUENCE LISTING

<110> DIXON, JANE
MCKINNON, DAVID

<120> Mammalian elk Potassium Channel Genes

<130> 3875-4138US1

<140> US 09/786,108

<141> 2001-02-27

<150> PCT/US99/19902

<151> 1999-08-31

<150> US 60/098,413

<151> 1998-08-31

<160> 16

<170> PatentIn version 3.2

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His	Leu	Gln	Arg	Arg	Glu	Lys	Asn	Lys	Leu	Lys	Ile	Asn	Asn	Asn	Val
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Phe	Val	Asp	Lys	Pro	Ala	Phe	Pro	Glu	Tyr	Lys	Val	Ser	Asp	Ala	Lys
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Ile Leu Asn Phe Arg Thr Thr Tyr Val Ser Lys Ser Gly Gln Val Ile
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Phe Glu Ala Arg Ser Ile Cys Ile His Tyr Val Thr Thr Trp Phe Ile
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Ile Asp Leu Ile Ala Ala Leu Pro Phe Asp Leu Leu Tyr Ala Phe Asn
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Val Thr Val Val Ser Leu Val His Leu Leu Lys Thr Val Arg Leu Leu
 325 330 335

Arg Leu Leu Arg Leu Leu Gln Lys Leu Asp Arg Tyr Ser Gln His Ser
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Thr Ile Val Leu Thr Leu Leu Met Ser Met Phe Ala Leu Leu Ala His
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Trp Met Ala Cys Ile Trp Tyr Val Ile Gly Lys Met Glu Arg Glu Asp
 370 375 380

Asn Ser Leu Leu Lys Trp Glu Val Gly Trp Leu His Glu Leu Gly Lys
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Arg Leu Glu Ser Pro Tyr Tyr Gly Asn Asn Thr Leu Gly Gly Pro Ser
 405 410 415

Ile Arg Ser Ala Tyr Ile Ala Ala Leu Tyr Phe Thr Leu Ser Ser Leu
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Thr Ser Val Gly Phe Gly Asn Val Ser Ala Asn Thr Asp Ala Glu Lys
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Ile Phe Ser Ile Cys Thr Met Leu Ile Gly Ala Leu Met His Ala Leu
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Val Phe Gly Asn Val Thr Ala Ile Ile Gln Arg Met Tyr Ser Arg Trp
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Ser Leu Tyr His Thr Arg Thr Lys Asp Leu Lys Asp Phe Ile Arg Val
 485 490 495

His His Leu Pro Gln Gln Leu Lys Gln Arg Met Leu Glu Tyr Phe Gln
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Thr Thr Trp Ser Val Asn Asn Gly Ile Asp Ser Asn Glu Leu Leu Lys
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Asp Phe Pro Asp Glu Leu Arg Ser Asp Ile Thr Met His Leu Asn Lys
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 545 550 555 560

Arg Ser Leu Ser Leu His Ile Lys Thr Ser Phe Cys Ala Pro Gly Glu
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Tyr Leu Leu Arg Gln Gly Asp Ala Leu Gln Ala Ile Tyr Phe Val Cys
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Ser Gly Ser Met Glu Val Leu Lys Asp Ser Met Val Leu Ala Ile Leu
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Gly Lys Gly Asp Leu Ile Gly Ala Asn Leu Ser Ile Lys Asp Gln Val
 610 615 620

Ile Lys Thr Asn Ala Asp Val Lys Ala Leu Thr Tyr Cys Asp Leu Gln
 625 630 635 640

Cys Ile Ile Leu Lys Gly Leu Phe Glu Val Leu Gly Leu Tyr Pro Glu
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Tyr Ala His Lys Phe Val Glu Asp Ile Gln His Asp Leu Thr Tyr Asn
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Leu Arg Glu Gly His Glu Ser Asp Val Ile Ser Arg Leu Ser Asn Lys
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Ser Thr Val Pro Gln Ala Glu Pro Lys Gly Asn Gly Ser Ile Lys Lys
 690 695 700

Arg Leu Pro Ser Ile Val Glu Asp Glu Glu Glu Glu Glu Val Glu Glu
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Glu Glu Thr Thr Ser Leu Ser Pro Ile Tyr Thr Arg Gly Ser Ser Val
 725 730 735

Ser His Ser Lys Lys Thr Gly Ser Ser Lys Ser Tyr Leu Gly Leu Ser
740 745 750

Leu Lys Gln Leu Thr Ser Gly Thr Val Pro Phe His Ser Pro Ile Arg
755 760 765

Val Ser Ser Ala Asn Ser Pro Lys Thr Lys Gln Glu Ala Asp Pro Pro
770 775 780

Asn His Gly Thr Arg Lys Glu Lys Asn Leu Lys Val Gln Leu Cys Ser
785 790 795 800

Leu Gly Thr Ala Gly Thr Pro Glu Leu Ser Pro Arg Ile Val Asp Gly
805 810 815

Ile Glu Asp Gly Asn Ser Ser Glu Glu Thr Gln Thr Phe Asp Phe Gly
820 825 830

Ser Glu Gln Ile Arg Pro Glu Pro Arg Ile Ser Pro Ser Leu Gly Glu
835 840 845

Ser Glu Ile Gly Ala Ala Phe Leu Phe Ile Lys Ala Glu Glu Thr Lys
850 855 860

Gln Gln Ile Asn Lys Leu Asn Ser Glu Val Thr Thr Leu Thr Gln Glu
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Val Ser Gln Leu Gly Lys Asp Met Arg Ser Ile Met Gln Leu Leu Glu
885 890 895

Asn Ile Leu Ser Pro Gln Gln Pro Ser Gln Phe Cys Ser Leu His Pro
900 905 910

Thr Ser Ile Cys Pro Ser Arg Glu Ser Phe Gln Thr Arg Val Ser Trp
915 920 925

Ser Ala His Gln Pro Cys Leu His Leu Gln Ala Asn Gly Ala His Leu
930 935 940

Tyr His Gly Asn Val Thr Ser Asp Ile Trp Ser Val Asp Pro Ser Leu
945 950 955 960

Val Gly Ser Asn Pro Gln Arg Thr Glu Ala His Glu Gln Ser Pro Val

965

970

975

Asp Ser Glu Leu His His Ser Pro Asn Leu Ala Tyr Ser Pro Ser His
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Cys Gln Val Ile Gln Glu Gly His Leu Gln Phe Leu Arg Cys Ile Ser
 995 1000 1005

Pro His Ser Asp Thr Thr Leu Thr Pro Leu Gln Ser Ile Ser Ala
 1010 1015 1020

Thr Leu Ser Ser Ser Val Cys Ser Ser Ser Glu Thr Ser Leu His
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Leu Val Leu Pro Ser Arg Ser Glu Glu Gly Ser Ile Thr His Gly
 1040 1045 1050

Pro Val Ser Ser Phe Ser Leu Glu Asn Leu Pro Gly Ser Trp Asp
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Arg Glu Gly Met Met Ser Ala Ser Thr Glu Pro Leu Glu Asn Phe
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Pro Val Glu Val Val Thr Ser Thr Ala Asp Val Lys Asp Ser Lys
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Ala Ile Asn Val
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 35 40 45

Arg Arg Ser Arg Ala Val Leu Tyr His Leu Ser Gly His Leu Gln Lys
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Gln Pro Lys Gly Lys His Lys Leu Asn Lys Gly Val Phe Gly Glu Lys
 65 70 75 80

Pro Asn Leu Pro Glu Tyr Lys Val Ala Ala Ile Arg Lys Ser Pro Phe
 85 90 95

Ile Leu Leu His Cys Gly Ala Leu Arg Ala Thr Trp Asp Gly Phe Ile
 100 105 110

Leu Leu Ala Thr Leu Tyr Val Ala Val Thr Val Pro Tyr Ser Val Cys
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Cys Asp Leu Ala Val Glu Val Leu Phe Ile
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Ser Val Val Asp Val Ile Phe Leu Val Asp Ile Val Leu Asn Phe His
 35 40 45

Thr Thr Phe Val Gly Pro Gly Gly Glu Val Ile Ser Asp Pro Lys Leu
 50 55 60

Ile Arg Met Asn Tyr Leu Lys Thr Trp Phe Val Ile Asp Leu Leu Ser
65 70 75 80

Cys Leu Pro Tyr Asp Ile Ile Asn Ala Phe Glu Asn Val Asp Glu Gly
85 90 95

Ile Ser Ser Leu Phe Ser Ser Leu Lys Val Val Arg Leu Leu Arg Leu
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Gly Arg Val Ala Arg Lys Leu Asp His Tyr Leu Glu Tyr Gly Ala Ala
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Asn Ala Arg Val Glu Asn Cys Ala Val Ile Tyr Cys Asn Asp Gly Phe
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Cys Glu Leu Cys Gly Tyr Ser Arg Ala Glu Val Met Gln Arg Pro Cys
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Thr Cys Asp Phe Leu His Gly Pro Arg Thr Gln Arg Arg Ala Ala Ala
65          70          75          80

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Gln Ile Ala Gln Ala Leu Leu Gly Ala Glu Glu Arg Lys Val Glu Ile
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Ala Phe Tyr Arg Lys Asp Gly Ser Cys Phe Leu Cys Leu Val Asp Val
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Val Pro Val Lys Asn Glu Asp Gly Ala Val Ile Met Phe Ile Leu Asn

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Lys Thr Phe Arg Leu Lys Leu Pro Ala Leu Leu Ala Leu Thr Ala Arg 165 170 175		
Glu Ser Pro Met Arg Thr Gly Ser Thr Gly Ser Pro Gly Ala Pro Gly 180 185 190		
Ala Val Val Val Asp Val Asp Leu Thr Pro Ala Ala Pro Ser Ser Glu 195 200 205		
Ser Leu Ala Leu Asp Glu Val Ser Ala Met Asp Asn His Val Ala Gly 210 215 220		
Leu Gly Pro Ala Glu Glu Arg Arg Ala Leu Val Gly Pro Ala Ser Ala 225 230 235 240		
Ser Pro Val Ala Ser Ile Pro Gly Pro His Pro Ser Pro Arg Ala Gln 245 250 255		
Ser Leu Asn Pro Asp Ala Ser Gly Ser Ser Cys Ser Leu Ala Arg Thr 260 265 270		
Arg Ser Arg Glu Ser Cys Ala Ser Val Arg Arg Ala Ser Ser Ala Asp 275 280 285		
Asp Ile Glu Ala Met Arg Ala Gly Ala Leu Pro Leu Pro Pro Arg His 290 295 300		
Ala Ser Thr Gly Ala Met His Pro Leu Arg Ser Gly Leu Leu Asn Ser 305 310 315 320		
Thr Ser Asp Ser Asp Leu Val Arg Tyr Arg Thr Ile Ser Lys Ile Pro 325 330 335		
Gln Ile Thr Leu Asn Phe Val Asp Leu Lys Gly Asp Pro Phe Leu Ala 340 345 350		

Ser Pro Thr Ser Asp Arg Glu Ile Ile Ala Pro Lys Ile Lys Glu Arg
 355 360 365

Thr His Asn Val Thr Glu Lys Val Thr Gln Val Leu Ser Leu Gly Ala
 370 375 380

Asp Val Leu Pro Glu Tyr Lys Leu Gln Ala Pro Arg Ile His Arg Trp
 385 390 395 400

Thr Ile Leu His Tyr Ser Pro Phe Lys Ala Val Trp Asp Trp Leu Ile
 405 410 415

Leu Leu Leu Val Ile Tyr Thr Ala Val Phe Thr Pro Tyr Ser Ala Ala
 420 425 430

Phe Leu Leu Lys Glu Thr Glu Asp Gly Ser Gln Ala Pro Asp Cys Gly
 435 440 445

Tyr Ala Cys Gln Pro Leu Ala Val Val Asp Leu Leu Val Asp Ile Met
 450 455 460

Phe Ile Val Asp Ile Leu Ile Asn Phe Arg Thr Thr Tyr Val Asn Ala
 465 470 475 480

Asn Glu Glu Val Val Ser His Pro Gly Arg Ile Ala Val His Tyr Phe
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Lys Gly Trp Phe Leu Ile Asp Met Val Ala Ala Ile Pro Phe Asp Leu
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Leu Ile Phe Gly Ser Gly Ser Glu Glu Leu Ile Gly Leu Leu Lys Thr
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Ala Arg Leu Leu Arg Leu Val Arg Val Ala Arg Lys Leu Asp Arg Tyr
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Ser Glu Tyr Gly Ala Ala Val Leu Phe Leu Leu Met Cys Thr Phe Ala
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Leu Ile Ala His Trp Leu Ala Cys Ile Trp Tyr Ala Ile Gly Asn Met
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Glu Gln Pro His Met Asp Ser His Ile Gly Trp Leu His Asn Leu Gly
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Asp Gln Ile Gly Lys Pro Tyr Asn Ser Ser Gly Leu Gly Gly Pro Ser
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 Ile Lys Asp Lys Tyr Val Thr Ala Leu Tyr Phe Thr Phe Ser Ser Leu
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 Thr Ser Val Gly Phe Gly Asn Val Ser Pro Asn Thr Asn Ser Glu Lys
 625 630 635 640
 Ile Phe Ser Ile Cys Val Met Leu Ile Gly Ser Leu Met Tyr Ala Ser
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 Ile Phe Gly Asn Val Ser Ala Ile Ile Gln Arg Leu Tyr Ser Gly Thr
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 Ala Arg Tyr His Thr Gln Met Leu Arg Val Arg Glu Phe Ile Arg Phe
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 His Gln Ile Pro Asn Pro Leu Arg Gln Arg Leu Glu Glu Tyr Phe Gln
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 His Ala Trp Ser Tyr Thr Asn Gly Ile Asp Met Asn Ala Val Leu Lys
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 Gly Phe Pro Glu Cys Leu Gln Ala Asp Ile Cys Leu His Leu Asn Arg
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 Ser Leu Leu Gln His Cys Lys Pro Phe Arg Gly Ala Thr Lys Gly Cys
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 Asp Thr Leu Val His Ala Gly Asp Leu Leu Thr Ala Leu Tyr Phe Ile
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 Ser Arg Gly Ser Ile Glu Ile Leu Arg Gly Asp Val Val Val Ala Ile
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 Leu Gly Lys Asn Asp Ile Phe Gly Glu Pro Leu Asn Leu Tyr Ala Arg
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 Pro Gly Lys Ser Asn Gly Asp Val Arg Ala Leu Thr Tyr Cys Asp Leu
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His Lys Ile His Arg Asp Asp Leu Leu Glu Val Leu Asp Met Tyr Pro
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Glu Phe Ser Asp His Phe Trp Ser Ser Leu Glu Ile Thr Phe Asn Leu
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Arg Asp Thr Asn Met Ile Pro Gly Ser Pro Ser Ser Ala Glu Leu Glu
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Ser Gly Phe Asn Arg Gln Arg Lys Arg Lys Leu Ser Phe Arg Arg Arg
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Thr Asp Lys Asp Thr Glu Gln Pro Gly Glu Val Ser Ala Leu Gly Gln
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Gly Pro Ala Arg Val Gly Pro Gly Pro Ser Cys Arg Gly Gln Pro Gly
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Gly Pro Trp Gly Glu Ser Pro Ser Ser Gly Pro Ser Ser Pro Glu Ser
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Ser Glu Asp Glu Gly Pro Gly Arg Ser Ser Ser Pro Leu Arg Leu Val
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Pro Phe Ser Ser Pro Arg Pro Pro Gly Asp Ser Pro Gly Gly Glu Pro
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Leu Thr Glu Asp Gly Glu Lys Ser Ser Asp Thr Cys Asn Pro Leu Ser
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Gly Ala Phe Ser Gly Val Ser Asn Ile Phe Ser Phe Trp Gly Asp Ser
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Arg Gly Arg Gln Tyr Gln Glu Leu Pro Arg Cys Pro Ala Pro Ala
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Pro Ser Leu Leu Asn Ile Pro Leu Ser Ser Pro Gly Arg Arg Ser
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Arg Gly Asp Val Glu Ser Arg Leu Asp Ala Leu Gln Arg Gln Asp
 1040 1045 1050

Asn Arg Leu Glu Thr Arg Leu Ser Ala Asp Met Ala Thr Val Leu

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Leu Pro Val Gly Pro Val Pro Thr Leu Thr Leu Asp Ser Leu Ser
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Gln Val Ser Gln Phe Val Ala Phe Glu Glu Leu Pro Ala Gly Ala
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Pro Glu Leu Pro Gln Asp Gly Pro Thr Arg Arg Leu Ser Leu Pro
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<400> 16

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Phe Leu Glu Asn Ile Val Arg Arg Ser Asn Asp Thr Asn Phe Val Leu
20          25          30

Gly Asn Ala Gln Ile Val Asp Trp Pro Ile Val Tyr Ser Asn Asp Gly
35          40          45

Phe Cys Lys Leu Ser Gly Tyr His Arg Ala Glu Val Met Gln Lys Ser
50          55          60

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Ser Ala Cys Ser Phe Met Tyr Gly Glu Leu Thr Asp Lys Asp Thr Val
65 70 75 80

Glu Lys Val Arg Gln Thr Phe Glu Asn Tyr Glu Met Asn Ser Phe Glu
85 90 95

Ile Leu Met Tyr Lys Lys Asn Arg Thr Pro Val Trp Phe Phe Val Lys
100 105 110

Ile Ala Pro Ile Arg Asn Glu Gln Asp Lys Val Val Leu Phe Leu Cys
115 120 125

Thr Phe Ser Asp Ile Thr Ala Phe Lys Gln Pro Ile Lys Asp Asp Ser
130 135 140

Cys Lys Gly Trp Gly Lys Phe Ala Arg Leu Thr Arg Ala Leu Thr Ser
145 150 155 160

Ser Arg Gly Val Leu Gln Gln Leu Ala Pro Ser Val Gln Lys Gly Glu
165 170 175

Asn Val His Lys His Ser Arg Leu Ala Glu Val Leu Gln Leu Gly Ser
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Asp Ile Leu Pro Gln Tyr Lys Gln Glu Ala Pro Lys Pro Pro His Ile
195 200 205

Ile Leu His Tyr Cys Val Phe Lys Thr Thr Thr Trp Asp Trp Ile Ile
210 215 220

Leu Ile Leu Thr Phe Tyr Thr Ala Ile Leu Val Pro Tyr Asn Val Ser
225 230 235 240

Phe Lys Thr Arg Gln Asn Asn Val Ala Trp Leu Val Val Asp Ser Ile
245 250 255

Val Asp Val Ile Phe Leu Val Asp Ile Val Leu Asn Phe His Thr Thr
260 265 270

Phe Val Gly Pro Ala Gly Glu Val Ile Ser Asp Pro Lys Leu Ile Arg
275 280 285

Met Asn Tyr Leu Lys Thr Trp Phe Val Ile Asp Leu Leu Ser Cys Leu
290 295 300

Pro Tyr Asp Val Ile Asn Ala Phe Glu Asn Val Asp Glu Gly Ile Ser
305 310 315 320

Ser Leu Phe Ser Ser Leu Lys Val Val Arg Leu Leu Arg Leu Gly Arg
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Val Ala Arg Lys Leu Asp His Tyr Ile Glu Tyr Gly Ala Ala Val Leu
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Val Leu Leu Val Cys Val Phe Gly Leu Ala Ala His Trp Met Ala Cys
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Ile Trp Tyr Ser Ile Gly Asp Tyr Glu Ile Phe Asp Glu Asp Thr Lys
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Thr Ile Arg Asn Asn Ser Trp Leu Tyr Gln Leu Ala Leu Asp Ile Gly
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Thr Pro Tyr Gln Phe Asn Gly Ser Gly Ser Gly Lys Trp Glu Gly Gly
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Pro Ser Lys Asn Ser Val Tyr Ile Ser Ser Leu Tyr Phe Thr Met Thr
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Ser Leu Thr Ser Val Gly Phe Gly Asn Ile Ala Pro Ser Thr Asp Ile
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Glu Lys Ile Phe Ala Val Ala Ile Met Met Ile Gly Ser Leu Leu Tyr
450 455 460

Ala Thr Ile Phe Gly Asn Val Thr Thr Ile Phe Gln Gln Met Tyr Ala
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Asn Thr Asn Arg Tyr His Glu Met Leu Asn Ser Val Arg Asp Phe Leu
485 490 495

Lys Leu Tyr Gln Val Pro Lys Gly Leu Ser Glu Arg Val Met Asp Tyr
500 505 510

Ile Val Ser Thr Trp Ser Met Ser Arg Gly Ile Asp Thr Lys Lys Val
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Leu Gln Ile Cys Pro Lys Asp Asn Arg Ala Asp Ile Cys Val His Leu
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Asn Arg Lys Val Phe Lys Glu His Pro Ala Phe Arg Leu Ala Ser Asp
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 Gly Cys Leu Arg Ala Leu Ala Met Glu Phe Gln Thr Val His Cys Ala
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 Pro Gly Asp Leu Ile Tyr His Ala Gly Glu Asp Val Asp Ser Leu Cys
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 Ala Thr Leu Ala Gln Ser Cys Ala Asn Val Arg Ala Leu Thr Tyr Cys
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770	775	780
Ala Lys Leu His Ala Pro Gly Ser Glu Cys Leu Gly Pro Lys Ala Gly 785 790 795 800		
Gly Gly Asp Pro Ala Lys Arg Lys Gly Trp Ala Arg Phe Lys Asp Ala 805 810 815		
Cys Gly Lys Gly Glu Asp Trp Asn Lys Val Ser Lys Ala Glu Ser Met 820 825 830		
Glu Thr Leu Pro Glu Arg Thr Lys Ala Ser Gly Glu Ala Thr Leu Lys 835 840 845		
Lys Thr Asp Ser Cys Asp Ser Gly Ile Thr Lys Ser Asp Leu Arg Leu 850 855 860		
Asp Asn Val Gly Glu Ala Pro Ser Pro Gln Asp Arg Ser Pro Ile Leu 865 870 875 880		
Ala Glu Val Lys His Ser Phe Tyr Pro Ile Pro Glu Gln Thr Leu Gln 885 890 895		
Ala Thr Val Leu Glu Val Lys His Glu Leu Lys Glu Asp Ile Lys Ala 900 905 910		
Leu Asn Ala Lys Met Thr Ser Ile Glu Lys Gln Leu Ser Glu Ile Leu 915 920 925		
Arg Ile Leu Met Ser Arg Gly Ser Ser Gln Ser Pro Gln Asp Ile Cys 930 935 940		
Glu Val Ser Arg Pro Gln Ser Pro Glu Ser Asp Arg Asp Ile Phe Gly 945 950 955 960		
Ala Ser		